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**THE EFFECTS OF CAREER AND TECHNICAL EDUCATION ON HIGH
SCHOOL GRADUATION RATES IN NEW JERSEY**

by

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A Thesis

Submitted to the
Department of Psychology
College of Science and Mathematics
In partial fulfillment of the requirement
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Thesis Chair: Roberta Dihoff, Ph.D.

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Dedications

I dedicate this manuscript to my parents, Rita and Matt; my brother, Matthew; my sister, Jessica and my biggest supporter Julia for their constant love and support throughout this research project.

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I would like to express my appreciation to Dr. Roberta Dihoff for her continued assistance and guidance throughout this research project. I would also like to thank Alicia Clendaniel for her help during this process.

Abstract

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THE EFFECTS OF CAREER AND TECHNICAL EDUCATION ON HIGH SCHOOL GRADUATION RATES IN NEW JERSEY

2016-2107

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Master of Arts in School Psychology

Trying to move away from the stigma of its purpose, Career and Technical Education (CTE) has been changing from the beginning of its implementation into the secondary school system. In its early years, CTE was for individuals entering the workforce directly after secondary school but recent research has shown the benefits that these programs are providing for students continuing their education post-secondary. The purpose of this study was to examine the effects that CTE has on high school graduation rates. This study was specifically exploring the effect of CTE programs in New Jersey high schools by comparing strictly CTE schools' graduation rates to comprehensive high schools' graduation rates in each county. Data was pulled from Department of Education website and identifying curriculum was pulled from school websites. Chi square tests were run to identify any relationships using SPSS for Windows.

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Chapter 1

Introduction

Need for Study

New Jersey's high school graduation rate rose in 2015, increasing to 89.7 percent in 2015 from 88.6 percent in 2014. This is the fourth straight year that the statewide high school graduation rate has increased, and the third consecutive year in which it grew by at least a full percentage point (Yaple 2016). Currently, there are 55 public vocational high schools in New Jersey out of 482 total public high schools. In 2015 69.2 % of students that graduated from high school were enrolled in a college or university. The percentage of students who graduated that were in the workforce was 36 % while the unemployment rate for these graduates were 20.7 %. Last year in New Jersey an average of 265,689 residents were unemployed and despite this decline from years past it is not as low as it was before the 2007 recession (NJLWD).

Purpose

There are many critics of Career and Technical Education in high schools, reporting that these schools are only for students who are at risk of not graduation or not continuing onto post-secondary school. The purpose of this study is to reject the stigma around CTE and show evidence of the success of these programs. CTE training has proven to be successful for at-risk students, students entering the workforce after graduation and students entering colleges or universities. This study tests one of the many assumed positive effects of CTE in high schools by looking at the graduation rates of New Jersey schools that implement these programs into their curriculum.

Hypothesis

A prediction of this study is that high schools in New Jersey with more CTE programs integrated into their curriculum would have higher graduation rates compared to high schools with minimal CTE programs integrated into their curriculum. Specifically, this study examines Career and Technical High Schools versus comprehensive secondary schools.

Significance of the Study

In the United States most CTE programs in high school give students the opportunity to take one or two courses a year in the program of their choice in addition to their general education courses. In other nations that have seen greater success in these programs, such as Switzerland or Singapore, allow their students to choose a specific vocation to study and all their coursework revolves around that choice of study (Leech 2014). Research shows that these countries have smaller unemployment rates, a possible indicator of success in CTE programs. By putting on emphasis vocational studies we give students the opportunity to study subjects and occupations that they are interested in. Secondary education was created to give students the tools to advance to higher education or to prepare them for the workforce. This study researches the success of these career and technical programs in New Jersey secondary schools, differences in dropout rates among high schools that give their students the opportunities to study courses that interest them and prepare them for the future. About forty percent of high school graduates seek full-time jobs after graduating without applying to any universities or colleges (Bishop 2005). It is important that these students are given the opportunity to

learn important specific skill sets to be considered for a job without anything but a high school diploma.

CTE programs empowers students by providing a range of learning opportunities that serve different learning styles (Advisory Committee for the National Assessment of Vocational Education 2003). Advocates of CTE argue that by giving students the option to choose courses specific to their future career paths will increase the likelihood of students staying in school. Not all students excel in academic courses but by offering them the chance to explore their career options through CTE, high schools are giving students a reason to graduate from school. This is proven by the positive effect on rates of graduation from upper-secondary school that has CTE options (Bishop 2004).

Definitions

Comprehensive Secondary School: A secondary school that has an academic focus, but also offer CTE either on or off site. (Levesque, et.al 2008)

Career and Technical School: A secondary school that emphasizes CTE, but also offer academic coursework; students typically spend their entire school day at the school. (Levesque, et.al 2008)

Graduation Rate: The number of students who graduate in four years with a regular high school diploma divided by the number of students who form the adjusted cohort for the graduating class. (DOE 2008)

Limitations

This research was all based on data found on the New Jersey Department of Education website. No data was collected from the high schools directly which could

have made the data more reliable and up to date. Schools included in the study were limited to schools with updated websites with curriculum information provided which also made the data very limited.

Assumptions

There were many assumptions made by the researcher in the present study. It was assumed by the researcher that:

1. The curriculum provided on school websites were representative of all CTE curriculum in New Jersey high schools.
2. The curriculum provided on the school's website was updated to its most recent form.
3. Schools provided true data to the New Jersey Department of Education.

The purpose of this study was to identify the different factors that allow for Hispanics' access to special education programs in New Jersey. This study analyzed data from low income counties in comparison to high income counties to determine differences, as opposed to other races. While exploring previous studies and existing research, there seemed to be a sufficient amount of different information on both sides. Many researchers believed that Hispanics are under-represented, while others believed that they are over represented. The purpose of this study was to compare different counties in New Jersey by exploring the poorest county and looking at the richest county to determine the percentages of minorities in each. This study hypothesized that the percentage of minorities in Special Education programs in low SES and high SES counties will differ. Was there a higher rate of Hispanics in these programs in different areas of New Jersey, like urban areas vs. suburban areas? "Special Education programs are designed for those students who are

mentally, physically, socially and/or emotionally delayed.” (“What is Special Education,” 2015). One limitation of this study was that the researcher used publicly available information and some of this information might have not been up to date. Another limitation was that some Hispanics whom actually might need to be in special education programs were not because their parent might disagree. Disproportionate representation in these programs means that the percentage of these groups in special education differs significantly from their percentage in the general school population.

Chapter 2

Literature Review

History of CTE

Smith –Hughes Act of 1917. The first push towards vocational education in secondary schools began in 1917 when the Smith-Hughes Act was passed. This was the legislation that officially established vocational education in our nation. The law provided for cooperation between the federal and state governments in regard to funding agriculture and trade and industry programs at the local level (Gordon, 1999). The reason for this act was to prepare youth for the industrial workforce since jobs in that field were in high demand at the time. At this time the main fields of focus for vocational courses were agriculture, homemaking, and trades and industry. This legislation provided teachers with preparation programs to teach in these different fields (Gray 2004).

In order for states to be funded by the federal government, they needed to agree to the following terms and a plan on how they were going to execute these terms.

Vocational education had to be supervised; its purpose was to fit students for employment. Vocational education would be less years of schooling than college to meet the needs of persons over 14 years old who had or were entering occupations. Another implication of the Smith-Hughes Act was the 50-25-25 rule. This rule stated that students must spend 50% of their time in shop classes, 25% of their time would be for academic courses, and the remaining 25% of their time would be for vocational coursework in a classroom. (Gray 2004)

The legislation for vocational education continued to change between the years of 1929 and 1942. A majority of these changes were brought on by the law known as the

George Acts. Each one of these laws added programs or changed the funds of different programs under the Smith-Hughes Act. As the need for industry workers was growing the funds needed for these vocational programs grew as well. Our nation wanted well-prepared youth for the workforce and the only way they were going to achieve that was through vocational education. (Gray 2004)

Carls D. Perkins Act. Career and technical education curriculum in secondary schools provide students with technical knowledge and skills needed to move into the workforce or continue education in the profession they study. (2006 Carl D. Perkins Career and Technical Education Improvement Act, P.L. 109-270). At a secondary level, these courses include marketing, business management, computer technology, food services, health care, childcare and education, and etc (Levesque, et.al 2008). The Carl D Perkins Career and Technical Education Act was first created in 1984 to replace prior legislations that were put in place dating back to 1917 with the Smith- Hughes Act (Threeton 2007). The Carl D Perkins Acts main purpose is to help improve technical education programs in United States secondary schools. Many changes have been made to the act since its original version created in 1984. In 1990 it was renamed Carl D. Perkins Vocational and Applied Technology Act, also known as Perkins II. The focus of this revision was to improve preparation for the workforce by supporting more vocational programs because the country was falling behind in skills compared to other countries. Perkins II was known to be the most effective version of the Carl D. Perkins Act because it provided more federal funding to vocational programs and changed policies to put more of an emphasis on occupational education and not just academics. The act was revised again in 1998, the Perkins III, with changes intended to integrate vocational and

academic education more sufficiently. The Act was renamed to the Carl D. Perkins Career and Technical Education Improvement Act when revisions were made again in 2006 (Threeton 2007). The new revisions included changing “vocational education” to “career and technical education.” The objective of CTE is to replace the old curriculum of vocational education that consisted of single electives and replacing it with a program of study that will prepare students for post-secondary school. Annually, 1.3 billion dollars are spread across all 50 states to fund their career and technical education (CTE) programs (ACTE, 2006). CTE training is defined by the Carl D. Perkins Career and Technical Education Improvement Act of 2006 as:

Organized educational activities that offer a sequence of courses that provides individuals with coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in current or emerging professions; provides technical skills proficiency, an industry-recognized credential, a certificate, or an associate degree; and may include prerequisite courses that meet the requirements of this subparagraph; and include competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of an industry, including entrepreneurship, of an individual.(Carl D. Perkins,2006, p. 1)

No Child Left Behind. The No Child Left Behind (NCLB) Act of 2001 was created to raise the achievement level of students and, to ensure that every student was prepared move on to post-secondary schooling. The purpose of NCLB is to make educational opportunities for minority and lower socioeconomic students equal (Fletcher

2006). This act included six key components: closing the achievement gap, improving literacy by putting reading first, expanding flexibility and reducing bureaucracy, rewarding success and sanctioning failure, promoting informed parental choice and improving teacher quality. Closing the achievement gap entails the following: each state implementing sanctions and rewards to hold districts and schools accountable for improving, has annual academic assessments for reading and math that provide information about how well the school is teaching the students, and consequences for schools that fail to educate every type of student equally. In order to improve literacy schools are mandated a comprehensive reading program that starts the focus on reading in earlier ages between kindergarten and second grade. Expanding flexibility and reducing bureaucracy includes more funding for technology (Bush 2001). CTE programs are an important part of the high school curriculum. Evaluations of CTE programs in schools and districts show CTE programs contribute to increased school attendance, reduced high school dropout rates, higher grades, and increased entry into postsecondary education (Brand, 2003).

Many perceive the NCLB Act to have no effect on CTE because it focuses on core academic subjects like reading and math. CTE advocates disagree; many believe that this legislation brought up concern for CTE programs because there were no standards for the areas of study laid out in the legislation (Chadd 2006). One issue that NCLB brings up for CTE programs is teacher quality. Teacher quality under NCLB is the requirement that teachers are “highly qualified” in the subject that they teach. Under this act “highly qualified” is defined as a teacher who is fully certified in the subject they are teaching. The teacher must have a bachelor’s degree and also be able to show the state

that they are competent in that specific subject area through a subject test NCLB pressure on CTE programs without a high emphasis on accountability and student achievement. Teachers were forced to prove that the skills learned in these technical courses were helping students reach academic standards and providing students skills for the workforce in the future. Many teachers believe that these CTE courses are helping to lower dropout rates and increase the number of students that graduate, which is one of the main goals of NCLB. (Gordon 2007)

Career and Technical Education

Career and Technical Education is a highly researched subject in the education field. Students, parents, educators and policymakers have mixed views on the success of these programs. Within the last 10 to 15 years, CTE programs have evolved from classes offered in school for low-performing students to rigorous academic classes that prepare students to go into post-secondary schools. The goals of CTE is to have education about occupations, education through the use of work and education for specific careers. (Plank 2005)

CTE training is provided in three main types of secondary schools. The first is a comprehensive secondary school, these are schools that will mainly focus on academic curriculum but offer CTE courses. These CTE courses can be provided at the school or outside of the school. The second type is CTE secondary schools which focus mainly on the CTE courses but also provide some academic courses, students will stay in the school for their CTE courses. Lastly, is area CTE schools, which are schools that students will go to outside of their high school where they only receive academic courses (Levesque, et.al 2008). CTE can also be offered to students in a dual enrollment, students will take

college-level courses that will count for both high school and college credits (Brand 2013). Currently in New Jersey, there are 55 CTE public high schools out of the 482 public schools, which is approximately 11% of the public high schools in New Jersey.

For many years there were two distinct pathways a student could take in high school. The first pathway was one that led to post-secondary schooling at a college or university. This pathway included academic curriculum including math, science and English courses and minimal vocational courses. Students who were looking to go in to entry-level positions after graduation had courses that included more vocational education including industry, agriculture, marketing, and distribution. CTE advocates are now looking to integrate these pathways that will give the students that opportunity to focus on both academic courses and CTE courses. They believe that these vocational courses are not only beneficial for students who are continuing to entry-level positions after graduation. (Plank 2001)

CTE has made many major contributions to our secondary public schools including improvement of academic skills to meet the demands of the technology-based economy, allowing students to be trained and qualified workers right out of high school, and meeting students where their needs are (Bottoms 2008). The objective of CTE programs is to increase students' abilities in critical thinking, collaboration, problem-solving, innovation and teamwork. CTE was once more focused on preparing students for entry level jobs, but now the aim is to prepare these students for a career (Brand 2013). Computer and information technology occupations are predicted to grow by 12% between 2014 and 2024. These occupations are expected to add about 488,500 new jobs, from 2014 to 2024 (Bureau of Labor and Statistics 2015). While there is a push for every

student to receive a bachelor's degree, realistically not every student that graduates from high school will go on to receive any degree after. Of New Jersey high school graduates between January and October 2015, only 69% enrolled in college post-graduation. This leaves 31% of youth looking for a job right after high school (Bureau of Labor and Statistics 2016). By enrolling in CTE courses in high school students will be more prepared to go straight through to the workforce.

Research also proves that CTE in secondary schools help students who are planning to attend a college or university. Many CTE programs are viewed as a placement for students that are at risk of not graduating or have a disability. While these programs do help these individuals tremendously, 80% of students that graduate from a CTE program graduate with the same amount of math and science credits as their peers in an only academic program. Of that group of students 60%, attend college after graduation. The goal of secondary education is to prepare students for post-secondary success. By taking CTE courses students can begin to make up a career plan that will lead them to this success. (Gray 2004)

CTE courses in high school give students that are considering technical post-secondary 2- year colleges an opportunity to begin to build skills in certain areas. For example students can begin to build skills for certifications like automotive, electrician, and cosmetics. In 2010, the second fastest growing field in the nation was a computer support technician, a profession that only requires one to two years of post-secondary schooling. These jobs do not require extreme qualifications but when a student begins to work on their skills for this occupation in high school they have the opportunity to attend less schooling post-secondary. (Gray 2004)

CTE and At-Risk Students

According to the American School Counseling Association “at risk” students, are those who could potentially drop out of school or engage in self-destructive behaviors that interfere with academic success. Behaviors including absenteeism, performing below academic potential or participating in activities that may be harmful to self and/or others such as substance abuse, threats and intimidation, and physical violence are some behaviors that place students at risk (ASCA; 2006-2008). Although research has shown that there are many consequences to dropping out of school including a higher likelihood of unemployment, a greater chance of living below the poverty line, more health problems, and increased likelihood of criminal activity our dropout rates are still high in this country (Plank 2008). Students who are considered “high risk” for dropping out or students who have disabilities are shown to have greater success in school when they are enrolled in these CTE courses. CTE has been shown to positively affect student’s retention and engagement in school (Brown 2003). A 2003 report from the Advisory Committee for the National Assessment of Vocational Education said that when you combine CTE courses with traditional academic courses students have shown more motivation to graduate and become more attached to school (Plank 2008).

CTE does not only help students who are at risk for not graduating, but also helps the students who are at risk for not finding employment after graduation. A study published in 2011 showed that there was a positive relationship between CTE course taking and post high school employment for students with learning disabilities (Shadden 2011).

New Jersey State Graduation Requirements

In 2010, New Jersey adopted a new state standard for education known as the Common Core. The transition to the new Common Core standards took place from 2011-2014. The goal of the Common Core Standards is to create grade-level expectations from kindergarten to twelfth grade. These standards are set in the subjects of mathematics and English Language Arts. Common Core does not provide schools with a curriculum, it only guides them to meet the standards for each grade level. Along with the education standards being changed, state testing was changed as well. In 2015 schools began using the Partnership for Assessment of Readiness for College and Careers (PARCC) state test. Beginning with the class of 2016, students must take these standardized tests at the end of their 9th, 10th, and 11th -grade year to determine the student's achievement. Along with the PARCC test students in the 11th grade must pass the New Jersey High School Proficiency Assessment (HSPA), this test assess the math and language arts literacy skills.

In addition to these tests, students must also complete 125 credits to receive their high school diploma. These 125 credits are broken down into different sections:

- 4 years of English (20 credits)
- 4 years of Physical Education and Health (16 credits)
- 3 years of Mathematics (15 credits)
- 3 years of Social Studies (15 credits)
- 1 year of a World Language (5 credits)
- 1 year of Visual or Performing Arts (5 credits)

- 1 year of 21st-century Life and Careers (5 credits)
- 1 semester of Financial Literacy (2.5 credits)

The remaining credits should provide students with courses that will prepare them for post-secondary education, immediate employment, or adult citizenship. (NJDOE 2016)

Transitioning from Secondary CTE to Post-Secondary

With CTE programs in high schools evolving throughout the years, the main goal has always been to prepare students for life after high school. A common mistake that has been debunked by many studies is that CTE is only for students who are work bound straight out of high school. This has been proven false. Through examination of newer models of CTE, researchers have found that these programs successfully help students transition from secondary to post-secondary education. There are four different programs that Donna Dare speaks about in her book *New Directions for Community Colleges*, High Schools That Work (HSTW), Tech Prep, College and Career Transition Initiative (CCTI), and Project Lead the Way (PLTW). Although all four programs are different they all share the common goal of preparing students for college or a career by combining CTE and academics. (Dare 2006)

High Schools that Work (HSTW) has gone through many reforms to change general high school curriculum to a combination of academic work and CTE curriculum. The focuses of this are reform high expectations for students, combining CTE and academic studies, work-based learning, teachers who work together, actively engaged students, guidance, and continuous improvement. (Dare 2006) Research done in 2005 by Bottoms and Anthony studied nine high schools using this model of HSTW. In this study, they found that one of the common strategies between these nine schools was to eliminate

lower level academic courses and raise graduation requirements above the state requirements. Another reform that five of the schools made in this study was to require that each student picks a specific career path by the ninth or tenth grade that would determine their courses through senior year. Their findings showed positive correlations between this model and students transitioning into post-secondary programs; 90 percent of the students that completed the HSTW course load in their study continued on to post-secondary education. While in these programs only 24 percent of students required remedial classes in post-secondary programs, and 34 percent of the students who did not complete the HSTW recommended course work. (Bottoms and Anthony 2005)

Tech Prep is similar to HSTW in regards to combining CTE courses with academic courses. Tech Prep also partners with post-secondary schools to make the transition from secondary to post-secondary easy on a student. There are debates on whether this type of model is successful for helping students. While a study done in 2002 shows successful outcomes of transitions from secondary to post-secondary, the National Association of Vocational Education views this model as problematic. Tech Prep is considered problematic because the implementation of the program is not consistent across schools that use this model. Identifying and tracking outcomes have also not been consistent which makes it difficult to identify success of this model accurately. The schools that have shown success in their data using this model do not only combine academic courses and CTE courses but also College Tech Prep which includes dual credits for students transitioning to the post-secondary program with whom the school is partnered with. (Dare 2006)

College and Career Transitions Initiatives (CCTI) not only focuses on what the secondary schools can do for the student but what role community colleges can play in this transition. CCTI focuses on helping students transition from high school to college and careers, increasing students' success, building partnerships with high schools and businesses, and lowering the number of remedial courses for incoming students. (Dare 2006) According to Hughes and Karp's study in 2006, the strength of this model lies in the strict policies enforced starting in Kindergarten through twelfth grade that ensures an easy transition to post-secondary programs. CCTI staff will meet to discuss state policy to ensure that the program is preparing students to the best of the model's ability (Hughes 2006)

The final model of CTE in high schools is Project Lead the Way (PLTW), a model where academic courses are combined with college prep academic courses and CTE courses. Although not much researching has been done on the outcomes of this model, there has been research done about the implementation of this program in high schools. Studies have shown that this model, compared to other CTE models, shows the most successful performances in academic courses such as math, reading, and science. Seventy two percent of students compared to 69 percent of students in other CTE programs show interest in post-secondary programs in the PLTW model.

These models are successful for students that are not ready for a four-year college but are interested in post- secondary programs in a community college. A lot of these models have relationships with community colleges and implement them into their secondary curriculum making the transition from secondary to post-secondary much smoother for students. CTE classes combined with academic courses help students gain

the knowledge and tools they need to have a successful transition into post-secondary programs.

Limitations of CTE

While there has been a lot of research done to show that CTE is effective in preparing students for their future in the workforce or continuing into post-secondary education, the program is still developing. A stigma surrounding CTE courses is that they are only for students with low abilities or a lack of motivation in their academic courses. This has been shown to be false through research. CTE classes have been shown to help students in areas of math, sciences, and engineering. Research shows that CTE courses are just as beneficial to students entering a post-secondary school as they are for students going directly into the workforce after graduation (Bartholomew 2014). These stigmas tend to overshadow the improvements CTE has made in the education field making parents and students skeptical about the CTE pathway in course taking. CTE continues to show positive outcomes for students and because of this, the stigma is slowly disappearing for educators (Brand 2013).

Another barrier that CTE has to overcome is the lack of high-qualified educators for these programs. To be highly qualified to teach these courses educators must meet a more specific certification than most teachers teaching the core academic classes. Teachers must be able to also show that they are educated in the specific career and have experience in the field. These specific requirements turn many professionals away from wanting to teach these CTE courses. Along with individuals in the education field not wanting to receive this training, the training for these educators is hard to find. Education

programs do not usually have a CTE track which results in a decline in applicants for these teaching positions. (Brand 2013)

One of the goals of The Perkins Act is to create an “academically rigorous, integrated, and sequenced programs of study that align with and lead to postsecondary education” (ACTE 2006). One of the main concerns that go along with CTE training is trouble aligning general education and career and technical education. It is important that students that students that are enrolled in CTE programs are prepared to move on to college after graduation. To ensure that this alignment happens, it is important that CTE programs work with post-secondary schools to ensure that the skills and knowledge that these students are gaining in high school prepare them for post-secondary school. This will give CTE programs the credibility that they need to continue to make the stigma connected to them disappear. (Brand 2013)

Career and Technical Education in New Jersey

According to statistics found on the Advanced CTE website, there are 368 public high schools in New Jersey. Of these high schools, 55 of them provide only or primarily CTE courses. Of the 425,356 students enrolled in high school in New Jersey 78,797, are enrolled in CTE programs and of that number, there are 42,239 students that are CTE concentrators. (ACTE 2016)

United States Department of Education provides statistics for different areas of secondary school that prove the success of CTE in New Jersey’s high schools. In the 2013-2014 academic year 94 percent of CTE students were proficient in Reading/Language Arts, 84 percent were proficient in Mathematics, 99 percent of students upon graduation entered a post-secondary program or a career, and 100 percent

of them went on to earn a certificate, credential or degree. (USDOE 2013) These statistics alone prove the success that students are able to achieve when entering a CTE program in high school. In 2013, 100 percent of CTE concentrators graduated, the national graduation rate for that year was 81 percent (Education Week Research Center 2015).

New Jersey has been actively working to improve their CTE programs in their secondary school. Training from High Schools That Work and Project Lead the Way are only a few ways that the state has provided for teachers and counselors that work in these schools. CTE programs are integrated into New Jersey's comprehensive high schools as well as separate vocational-technical high schools. The state of New Jersey has a program, New Jersey Career and Technical Education Partnership (CTEP), which promotes links between their secondary schools, post-secondary programs and the resources the students will need for their specific career clusters. Along with the standard career clusters provided in CTE programs, New Jersey is one of the four states in the United States to be incorporating the study of green construction, sustainable design and energy into some of its CTE programs. CTE programs in New Jersey must be re-approved every five years by the New Jersey Department of Education. (Association of Career and Technical Education 2017)

In 2014, there were some significant changes made to the CTE-related legislation that added requirements that must be met by the CTE approved programs in New Jersey. The requirements included: adding student career readiness indicators in new Jersey School Report Card, requiring preparation programs for teachers and school counselors, strengthening partnerships between County Vocational- Technical schools and local schools and colleges through a grant program in the NJDOE increasing enrollment dual

enrollment programs. In addition, new CTE standards were set that provided academic standards and career-ready standards for kindergarten to twelfth grade students. Another standard in New Jersey is the end of the program test that every student enrolled in a CTE program must complete. There are four different examinations or assessments used to test students, a state licensure examination, an industry- organized skill examination, a state-developed end-of-program assessment or a nationally recognized and state recognized third party assessment. (Association of Career and Technical Education 2017)

Summary

When CTE was first implemented in the United States it had a steady enrollment, but entering the early 1990s these enrollments began to decline. To bring the enrollment number back up many changes were made to CTE programs. The biggest change was its purpose. CTE programs were no longer aimed at only the students who were entering the workforce, but also to prepare students for the transition into post-secondary programs. (Lynch 2000) Research has found that students who are a part of a CTE program are enrolled in more challenging classes than those in a traditional academic program. A decrease in dropout rates has been found when a student takes a ratio of one CTE course to two academic courses. (Gentry 2007)

While CTE is still viewed as a program for students who are seeking work directly out of high school, the statistics do not match. In 2005, a study was done by Gaunt and Palmer that showed that approximately 60% of CTE students enrolled in a post-secondary program. When high school students are asked their thoughts on CTE, researchers have found that students think these programs help students not only who are work bound but college bound as well. CTE programs seem to be beneficial for both at-

risk students, gifted and talented students however not much research has been done on the specific benefits for specific types of students. This does not take away from the statistics that show the overall benefits of these programs in secondary schools. (Gentry 2007)

Chapter 3

Methods

The current study is aimed to examine and identify the relationship between graduation rates and CTE curriculum in New Jersey High Schools. Specifically to identify if career and technical secondary schools have higher graduation rates than comprehensive secondary schools.

Participants

The current study's participants included one career and technical school and one comprehensive secondary school from each of the twenty-one New Jersey counties. Out of the 482 secondary schools in New Jersey in 2015, there was a sample of 36 schools chosen for this study. The 36 schools were chosen the accessibility of the school's curriculum handbook. Socioeconomic status, race/ ethnicity, and gender of students were disregarded in this study.

Materials

The materials used for this study included data found on the State of New Jersey Department of Education website. The data included graduation rates for the years of 2011 to 2014. This data included the total graduation rates of each school in New Jersey. This data also provided me with specific data on different types of students, students with disabilities, limited English proficiency and economically disadvantaged.

Additional material for this study included the New Jersey high school graduation requirements specific for each year between 2011 and 2014. School curriculum handbooks were also collected via school websites. Curriculum handbooks provided

information on specific CTE programs the school's provided as well as the schools requirements for academic classes and CTE courses.

The dependent variable measured in this study was the overall average of graduation rates each year from the high schools chosen for the study.

Procedures

Schools were chosen to be a part of this study based on school size and type of school. A comprehensive secondary school and CTE- specific school were pulled from each county using school size as the deciding factor. All of the 42 schools chosen for this study are close in four- year cohort size.

Statistical Analysis

The collected data was analyzed using a mixed ANOVA test to determine if there is a significant difference between CTE-specific schools and graduation rates. To run this test the program SPSS for Windows was used. The average graduation rates were collected for CTE-specific schools and then the average graduation rates of comprehensive schools were collected from the sample across the years of 2011-2015. These averages were compared using the mixed ANOVA to determine if there was a statistically significant difference between graduation rates of CTE specific schools and comprehensive schools.

Chapter 4

Results

The hypothesis was whether more CTE curriculum in schools effect graduation rates positively when compared with comprehensive high schools.

As seen on Figure 1 a mixed ANOVA was run to determine the difference between type of high school and graduation rates. The independent variables tested were school year (within variable) and school type (independent variable). A statistically significant relationship was found between type of high school and graduation rates. CTE high schools were found to have higher graduation rates compared to comprehensive high schools in New Jersey $F(1,38) = 8.522$ $p = .006$.

The graduation rates collected were from 2011 to 2015. No significant difference was found between the years. There was no significant interaction between type of school and year.

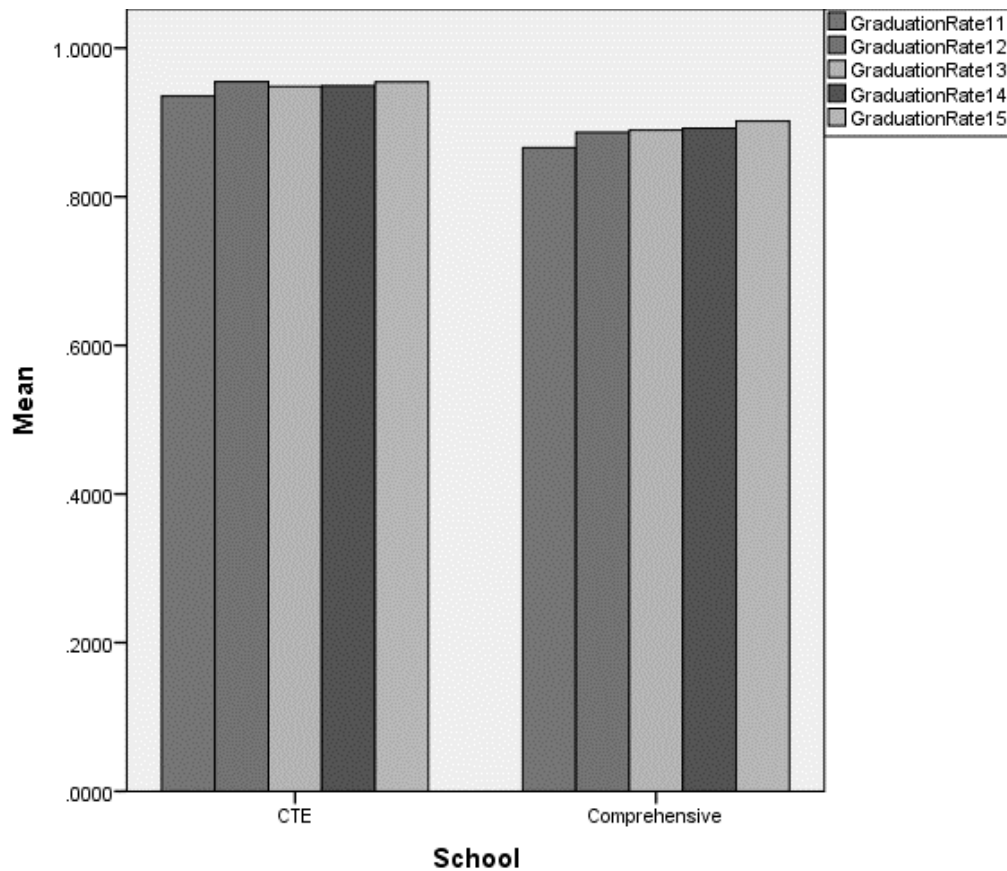


Figure 1. Graduation Rates

Summary

Descriptive statistics showed that the mean graduation rate for CTE high schools across the years of 2011 to 2015 was .94839. Comprehensive high schools showed a mean of .88716 across the years of 2011 to 2015.

Chapter 5

Discussion

Summary

The current study aimed to assess and identify differences in graduation rates between comprehensive high schools and Career and Technical high schools in New Jersey. Specifically looking to see if CTE high schools showed to have higher graduation rates between the years of 2011 and 2015. It was hypothesized that CTE high schools would overall show higher graduation rates across New Jersey. If there was a significant difference found between the graduation rates of these two types of high school we could infer that CTE curriculum was having a positive impact on students graduating from high school between these years.

Based on the mixed ANOVA test performed, a statistically significant difference was found between graduation rates of comprehensive schools and graduation rates of CTE schools. Results of the mixed ANOVA showed higher graduation rates in CTE high schools. These results show that further research should be performed to determine factors on why CTE high schools show higher graduation rates in New Jersey.

Limitations

Although this study showed significant evidence about the effectiveness of CTE curriculum on graduation rates, there were many limitations. One of the largest limitations was that each county in New Jersey did not have a CTE high school. Three of the counties including Cumberland County, Hunterdon County, and Mercer County were

excluded from the study because there was no CTE high schools in those areas. Therefore the data did not represent all counties in the state of New Jersey.

Future Research

The current study was developed to determine if there was a difference in graduation rates of comprehensive high schools and CTE high schools in New Jersey. After finding that CTE high schools show higher graduation rates in New Jersey, future research should start to further investigate factors surrounding the success of CTE high schools. This can be accomplished by looking at the demographics of these CTE high schools, the area that the school is in, and student satisfaction ratings in CTE high schools. As mentioned in previous research CTE has been shown to positively affect student's retention and engagement in school (Brown 2003). Future researchers should look deeper in to the factors surrounding this positive effect. This can be achieved by surveying students who are currently enrolled in CTE programs and determine the satisfaction rate of the students and the positive affect they believe this specific CTE curriculum is having on their education and their attitude about their education. In conclusion, future research should be done to determine specific factors that surround CTE schools positive affect so that we can better understand how to make every student successful in high school.

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